

553,932

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number
WO 2005/005911 A2

(51) International Patent Classification⁷: **F42B**
(21) International Application Number:
PCT/US2004/013340

(22) International Filing Date: 30 April 2004 (30.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/466,551 30 April 2003 (30.04.2003) US

(71) Applicant (for all designated States except US): **DYNO NOBEL, INC.** [US/US]; Eleventh Floor, Crossroads Tower, Salt Lake City, UT 84144-0103 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TWAROG, JR., Joseph, W.** [US/US]; 41 Horseshoe Circle, Barkhamsted, CT 06063 (US). **CAMPBELL, John** [US/US]; 63 Alexander Drive, East Hartford, CT 06118 (US). **PLITT, Tyson** [US/US]; 17 Goosegreen Road, Barkhamsted, CT 06063 (US). **HO, Kim Chi** [US/US]; 59 Burnham Street, Plainville, CT 06062 (US).

(74) Agent: **SPAETH, Frederick, A.**; Cantor Colburn LLP, 55 Griffin Road South, Bloomfield, CT 06002 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

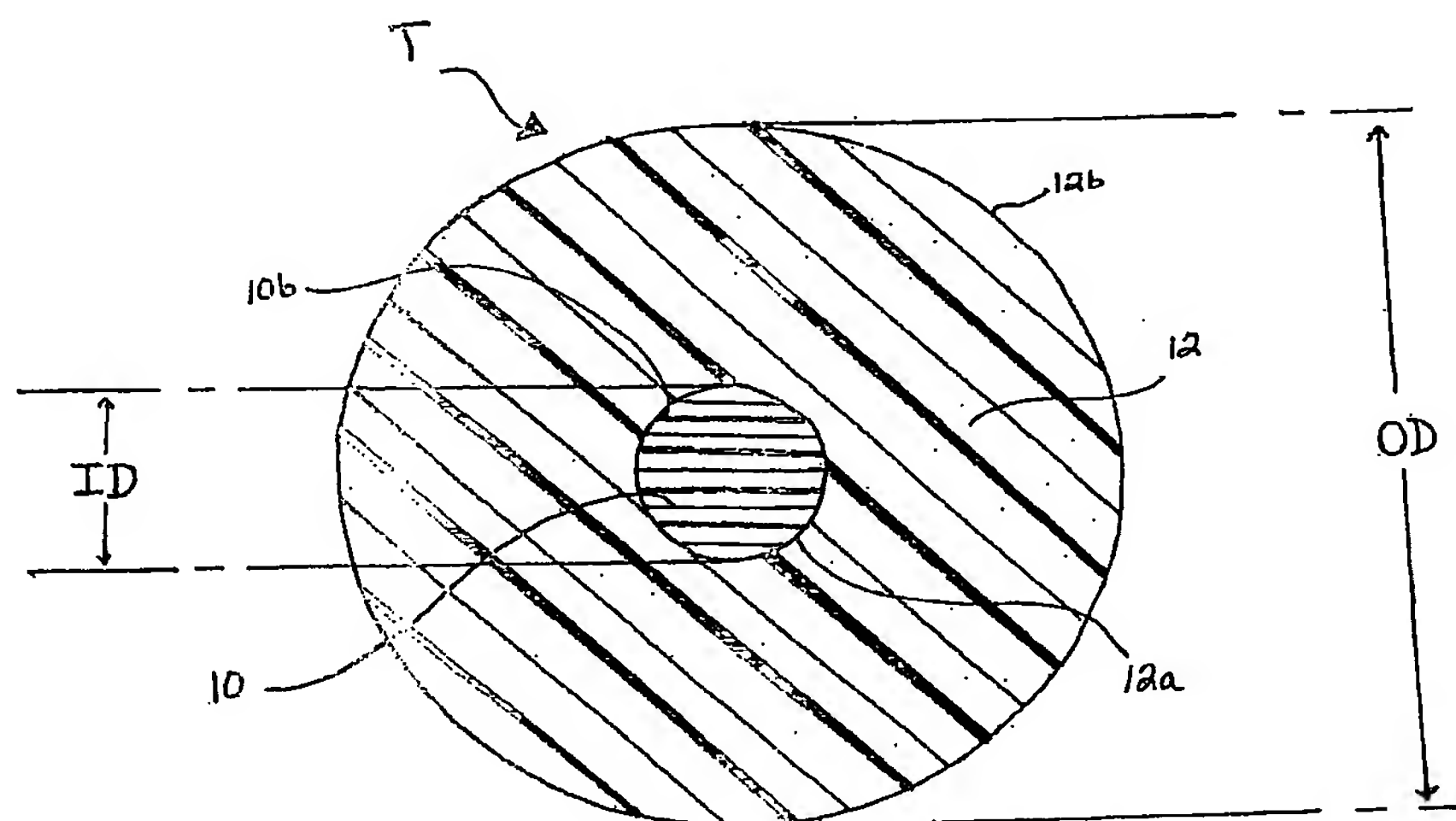
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **ENERGETIC LINEAR TIMING ELEMENT**



(57) Abstract: A timing element for an initiator is made from a reactive polymeric material such as, e.g., a glycidyl azide polymer. The reactive polymeric material may include pulverulent oxidizer additives, such as ammonium, perchlorate and/or ferric oxide. The oxidizer additives are used to increase the rate of reaction and the output spark of the polymer material. The timing element serves to delay the travel of an initiation signal between an input, such as a signal transmission input line, and an explosive output charge, for a predetermined period of time, usually about 5 to about 10,000 milliseconds, e.g., about 9 to about 9600 milliseconds.

WO 2005/005911 A2